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Fax:	571-273-8300	**Fax:**	864-503-1999
Phone:		**Phone:**	864-503-1597
Subject:	**Serial No: 10/678,996** **Docket No: 2992 A** **Application of: Kimbrell et al.** ***CHEMICAL MODIFICATION OF HYDROLIZABLE POLYMER-CONTAINING TEXTILE ARTICLES***	**Date:**	October 15, 2007
Copies:		**Pages:**	35 (including cover)

Comments:

Please find as follows:

Transmittal Sheet	-1 page
Reply Brief	- 4 pages
Exhibit A	- 2 pages
Exhibit B	- 8 pages
Exhibit C	- 7 pages
Exhibit D	- 8 pages
Exhibit E	- 5 pages

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:	William C. Kimbrell, Jr.
Serial Number:	10/678,996
Filed:	October 3, 2003
For:	**CHEMICAL MODIFICATION OF HYDROLIZABLE POLYMER-CONTAINING TEXTILE ARTICLES**
Group Art Unit:	1771
Examiner:	Cole, Elizabeth M.

REPLY BRIEF

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

CERTIFICATE OF FACSIMILE TRANSMISSION UNDER 37 C.F.R. § 1.8(d)
I hereby certify that this correspondence is being transmitted by facsimile to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, at (571) 273-8300.
Date: October 15, 2007
Signature: Melody Towery
Name: Melody Towery

Sir:

The following Reply Brief is submitted in response to the Examiner's Answer dated September 17, 2007.

REMARKS

Claims 1-27, 29 and 39-43 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Andersen et al. (US Patent No. 5,997,584) in view of Kimbrell (WO 96/22416) and further in view of a Tomah General Product Catalog.

Appellant respectfully submits that the combination of references, when properly taken as a whole, actually teaches away from Appellant's claimed invention. Accordingly, Appellant submits that the rejection fails to establish a *prima facie* showing of obviousness. Case law states that "[A] prior art reference may be considered to teach away when 'a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.'" Monarch Knitting Machinery Corp. v. Sulzer Morat GmbH, 1998 WL 117765 at *8 (Fed. Cir. 1998); In re Gurley, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994).

It is pointed out that the Kimbrell reference cited by the Office – WO96/22416 – corresponds to USPN 6,113,656, which is discussed by Appellant on pages 2-4 of the specification.

In the discussion of the Kimbrell reference, Appellant states the following (pages 2-4; underlining added):

> Textile manufacturers face a multitude of challenges in attempting to resolve the pilling issue on fabrics containing certain polyester yarns. For example, textile chemists have applied binders to increase the force required to remove fibers from the fiber bundle; however, this typically results in detrimental changes to the feel of the fabric and the effect is generally reduced by washing of the garment. Some effort has been devoted to lowering the fiber strength by various chemical treatments. Hydrolysis with, for instance, sodium hydroxide does indeed lower the fiber strength, but it is difficult to precisely control this process and the resulting fabric also undergoes a significant weight loss. Aminolysis of the ester linkage of the polymer, such as addressed by Farmer in commonly-assigned U.S. Pat. No. 4,103,051, indeed achieves the desired properties, but also can adversely affect the dyeing of the resulting fabric. This disadvantage is addressed by commonly-assigned U.S. Pat. No. 6,113,656 to Kimbrell which discloses a method for improving the dyeing of fabric treated with the Farmer chemistry. In addition, the structure of the amines disclosed by Farmer, especially those preferred by Farmer, can lead to chemical handling issues in textile finishing facilities and also to quality issues resulting from attempting to handle such chemicals. Furthermore, it has proven difficult to control the batch to batch variation, within a somewhat narrow range, on certain styles, which in turn, leads to significant treated yardage that is not acceptable, either due to poor pilling performance or excessive strength loss.

> It has been shown by Farmer in U.S. Pat. No. 4,103,051 that organic amines are a particularly preferred class of compounds for this type of reaction, resulting in generally good control of the degree of pilling improvement obtained. Farmer discloses the use of aliphatic amines containing at least 10 carbon atoms. In addition, Farmer states that aliphatic amines, such as n-coco-1,3-propanediamine, are the preferred amines for this process.
>
> It has been found that the use of the above-mentioned fatty diamines can impart detrimental variability to the textiles treated by this process. First these fatty diamines, especially those containing greater than 10 carbon atoms, tend to solidify at or around room temperature. This necessitates special storage and handling requirements in a typical textile dyeing operation such as, for example, drum heaters or other heating equipment to maintain the amine at a temperature above its melting point. Second, these compounds, such as the n-coco-1,3-propanediamine preferred by Farmer, are mixtures of unbranched carbon chains containing from 8 to18 carbon atoms. This mixture tends to separate according to the size of the carbon chain resulting in unacceptable variations of the chemical composition and the degree of strength reduction obtained by this process. This again leads to special chemical handling requirements to minimize this potential variable, such as the use of drum mixers. Finally such diamines are known to adsorb and react with carbon dioxide from the air, resulting in an insoluble carbamate that does not react with polyester. Without special attention to controlling the exposure of these amines to the air, various mixtures of products result. The net result can be less than the necessary amount of active amine being used to obtain the required strength reduction necessary to achieve good pilling performance. All of these potential chemical variations result in a process, and hence a modified polyester product, that can be very difficult to control within acceptable product performance tolerances.

With regard to the teachings of Kimbrell, Appellant notes that on page 5 (lines 9-18), Kimbrell teaches the use of aliphatic amines for reducing the pilling tendency of fabrics. Kimbrell specifically teaches an aliphatic amine such as N-coco-1,3-propanediamine (page 5, line 17), which Appellant provides as a comparative example in the specification (see Appellant's specification, page 14). The test results provided by Appellant (see pages 15-18 of the specification) clearly illustrate the benefits of using the branched chain amines recited by the instant claims over the aliphatic amines taught by Kimbrell.

Furthermore, since Kimbrell teaches the use of the same aliphatic amines as those taught by Farmer in USPN 4,103,051 (see Kimbrell – bottom page 3 to top page 4), Appellant submits herewith copies of Exhibits A – E, which were submitted by Appellant with the Response dated May 19, 2005. Exhibits A – E provide evidence that the amines taught by Kimbrell (and Farmer) are not branched chain amines, as claimed by Appellants. Rather, Kimbrell teaches straight chain amines. Accordingly, Appellant respectfully submits that one of ordinary skill in the art would be led away from Appellant's claimed invention by the teachings of Kimbrell and further by the combined teachings of Andersen, Kimbrell and Tomah.

Thus, Appellant respectfully submits that when properly taken as a whole, the combination of Andersen in view of Kimbrell and further in view of Tomah product catalog actually teaches away from Appellant's claimed invention. As such, Appellant respectfully asserts that a *prima facie* case of obviousness has not been established. Accordingly, Appellant respectfully submits that this rejection is improper. Reversal of this rejection is earnestly requested.

Thus, for the reasons set forth above, and as set forth in Appellant's Appeal Brief previously submitted, Appellant respectfully urges that the rejections of Claims 1 – 27, 29 and 39 – 43 are improper. Reversal of all rejections is hereby requested.

The Commissioner is authorized to charge any fees that may be required, or credit any over-payment, to Deposit Account No. 04-0500.

Respectfully submitted,

October 15, 2007

Brenda D. Wentz

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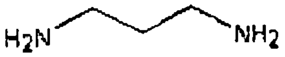
EXHIBIT A

1,3-Propanediamine

Exhibit A

- **Formula:** $C_3H_{10}N_2$
- **Molecular Weight:** 74.12
- **CAS Registry Number:** 109-76-2
- **Chemical Structure:**



This structure is also available as a 2d Mol file.

- **Other Names:** Propane-1,3-diamine; Trimethylenediamine; 1,3-Diaminopropane; 1,3-Propylenediamine; H2N(CH2)3NH2
- Notes / Error Report
- **Other Data Available:**
  - Phase change data
  - Reaction thermochemistry data
  - Gas phase ion energetics data
  - Ion clustering data
  - Mass Spectrum
  - Gas phase kinetics (on kinetics web site)
- Switch to calorie-based units

Notes / Error Report

Go To: Top

- Data from NIST Standard Reference Database 69 - March 2003 Release: *NIST Chemistry WebBook*
- The National Institute of Standards and Technology (NIST) uses its best efforts to deliver a high quality copy of the Database and to verify that the data contained therein have been selected on the basis of sound scientific judgment. However, NIST makes no warranties to that effect, and NIST shall not be liable for any damage that may result from errors or omissions in the Database.
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EXHIBIT D

AKZO NOBEL

Product Information **Surface Chemistry**

Exhibit B

DUOMEEN® CD

Cocopropylenediamine, distilled
CAS no 61791-63-7

Primary alkyl amine of the general formula

$R\text{-}NH\text{-}(CH_2)_3\text{-}NH_2$

where R represents an alkyl straight chain mainly C12 + C14.

CAS Name: Amines, N-coco alkyltrimethylenediamine

EINECS: 263-195-3

Specification

	Limits	**Method**
Amine number, total	388-450 mgKOH/g	VV/4.001*
Colour	max 3 Gardner	SC/2.001*
Diamine, Mw=257	min. 89%	VV/4.001*
Water content	max. 0.5%	VE/4.003*

*Methods of analysis can be received upon request.

Typical data

Chemical and physical data	**Typical values**
Appearance, 20°C	yellow liquid / paste
Density, 20°C	840 kg/m³
Density, 60°C	820 kg/m³
Equivalent Mass	131g/eq
Flash point	>150°C
Iodine value	6 g I /100g
Melting range	24-30°C
Odour	ammonia like
Viscosity, 60°C	4 mPa s

Solubility
Soluble to a varying extent in alcohols (ethanol, 2-propanol), chloroform and other hydrocarbons.

Typical data are based on our own measurements or derived from the literature. They do not constitute part of the delivery specifications.

Alkyl Chain Distribution	**Typical values**
Alkyl chain distr C_8	5%
Alkyl chain distr C_{10}	6%
Alkyl chain distr C_{12}	50%
Alkyl chain distr C_{14}	19%
Alkyl chain distr C_{16}	10%
Alkyl chain distr C_{18}	10%

The specifications and properties listed above are intended for products manufactured in Europe.

Applications/Functions

* Disinfection
* Sanitizing

* Bactericide / bacteristat
* Fungicide / fungistat
* Algicide / algistat

Packing

- Bulk,
- Drums, steel tight head, net weight: 160 kg

Storage and Handling

The product is stable for at least 2 years, if stored at room temperature in sealed and undamaged containers.

The product is not corrosive to ferrous metals. Containers made from stainless steel or high-density polyethylene can be used. Glass lined vessels are also suitable. Zinc, copper, aluminum or their alloys should not be used. Contact with low-density PE, PVC and most rubbers is to be avoided as this may cause swelling or cracking of these materials.

To maintain colour, the product should be stored below, or in the case of bulk storage, only slightly above the melting point. Higher temperatures can be tolerated where colour maintenance is not of concern. However, the maximum recommended heating coil surface temperature is 100 °C. Prolonged heated storage in air can cause discolouration and degradation. Heated storage vessels should be sealed (with a vent pipe) and preferably be nitrogen blanketed.

If the product is handled and stored at temperatures near or below its melting point there is a risk of separation. In such cases the entire amount should be heated until it melts and homogenizes.

Even at ambient temperatures, amines can absorb carbon dioxide and water from the atmosphere. Absorbed carbon dioxide and moisture can be removed by heating the product above 100 °C.

For cleaning up spoilages collect as much as possible in a clean container for reuse or disposal, absorb the remainder in vermiculite. Metal surfaces can be cleaned with high pressure hot water. For more persistent deposits, high pressure steam or washing with hot 3% acetic acid may be necessary.

Health and Safety

goggles should be used. Avoid contact with skin and inhalation of vapors. For further information on health and safety see our Safety Data Sheet.

Further Information

For further Information, technical service and samples, please contact our nearest Akzo Nobel Sales office or agent/distributor.

DUOMEEN® is a registered trademark in many countries.

Issued: 2002-05-25

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AKZO NOBEL

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY UNDERTAKING

Trade name	**DUOMEEN CD**
Chemical description/Application	Corrosion inhibitor.
Supplier	Akzo Nobel Surface Chemistry AB SE 444 85 Stenungsund SWEDEN Tel: +46 303 850 00 Fax: +46 303 813 06
Emergency telephone	+ 31 570679211 (Fax. +31 570679801) Akzo Nobel Chemicals, Deventer, NL

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a substance according to EU-legislation.

Substance name	EU number	CAS number	Concentration	Symbols	Risk phrases
N-Coco-1,3-diaminopropane	263-195-3	61791-63-7	>89 %	C ,N	R-22, 35, 50

Other Information	The substance is registered in EINECS.

3. HAZARDS IDENTIFICATION

Corrosive. Causes severe burns. Harmful if swallowed. Burns may occur several hours after the removal of the product. Dangerous for the environment. Very toxic to aquatic organisms.

4. FIRST AID MEASURES

General	Obtain medical attention immediately (show this Safety Data Sheet). Burns may occur several hours after the removal of the product. Skin irritation, if untreated may be prolonged and serious (eg necrosis). This may be prevented by early treatment with medium strength corticosteriods.
Inhalation	Not likely to occur. In case of exposure: Rinse nose and mouth with water. Obtain medical attention.
Skin	Remove immediately contaminated clothing and shoes. Wash skin immediately with 0.5 % acetic acid in water, and then with soap and water. Obtain medical attention.
Eyes	In case of contact with eyes, rinse immediately with 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention immediately. Continue to rinse during transport.
Ingestion	Only when conscious, rinse mouth, give plenty of water to drink (approx. 500 ml). Do not induce vomiting! Obtain medical attention immediately.

5. FIRE FIGHTING MEASURES

Extinguishing media	Water spray, fog or mist, foam, powder, carbon dioxide.
Unsuitable extinguishing media	Waterjet.
Special fire fighting procedures	Treat as an oil fire. Water spray may be ineffective unless used by experienced fire fighters. Wear self contained breathing apparatus.
Unusual fire hazards	Non-flammable. If involved in a fire it will support combustion and may decompose to give off toxic materials. Do not breathe fumes.
Hazardous combustion products	No typical hazardous decomposition products known.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	For personal protection see Section 8.
Environmental precautions	Should not be allowed to enter drains or water courses. Dispose of this material and its container at hazardous or special waste collection point.
Methods for cleaning up	Contain spill with inert material. Place in container for disposal according to local regulations. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. In case of large spillages contact the local authority.

7. HANDLING AND STORAGE

Handling	The usual precautions for handling chemicals should be observed. When using do not eat, drink or smoke. Avoid spilling, skin and eye contact.
Storage	To maintain quality: Avoid elevated temperatures. Reacts with copper, aluminium, zinc and their alloys. For further information see product information sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits	
Comments	No exposure limits have been established.
Engineering controls	Provide eyewash station and safety shower. Keep solutions of 0.5% acetic acid in water at hand.
Personal protection	
Respiratory	Keep respiratory equipment available. If use conditions can generate aerosol or mist, wear suitable respiratory equipment. Wear full face mask supplied with: Gas cartridge K (ammonia, green). Combination filter ABEKP.
Hand	Use protective gloves made of: Nitrile or butyl rubber.
Eyes	Wear tightly fitting safety goggles and full face visor or shield.
Skin and body	Use suitable protective clothing as protection against splashing or contamination. Dry-clean contaminated clothes before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid/paste.	
Colour	Yellow.	
Odour	Slightly ammonia like	
Boiling point/range (°C)	> 300	Pressure (kPa)

Melting point/range (°C)	24-30		
Flash point (°C)	> 100	**Method**	Pensky-Martens ISO 2719
Autoignition temperature (°C)	> 135		
Lower explosion limit (vol %)	-		
Upper explosion limit (vol %)	-		
Vapour pressure	< 10 Pa	**Temperature (°C)**	20
Relative vapour density (air=1)	-		
Density (kg/m3)	840	**Temperature (°C)**	25
Bulk density (kg/m3)	-		
Viscosity	5 mPas	**Temperature (°C)**	60
pH value	-		
pH value diluted solution	-	**Conc. (%)**	
Solubility in water	Insoluble.		
Solubility in other solvents	Soluble in alcohols.		
Partition coefficient (log Pow)	-		

(These data are typical for the product and not a specification)

10. STABILITY AND REACTIVITY

Stability	Avoid elevated temperatures. Stable under recommended storage and handling conditions (see section 7).
Hazardous decomposition products	No typical hazardous decomposition products known.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Health effects

Respiratory	Emits vapours during heating. Inhalation of small volume of vapour may cause irritation of nose, throat and airway.
Skin	Causes severe burns. Burns may occur several hours after the removal of the product. May be absorbed through the skin.
Eyes	Causes burns. Risk of serious damage to eye. Vapour in the eyes may cause irritation and pain.
Ingestion	May cause burns in mucous membranes in throat, oesophagus and stomach.
Component	**N-Coco-1,3-diaminopropane**
Toxicological data	
	LD50. oral rat 200-2000 mg/kg
Genotoxicity	Ames' test: Not mutagenic. Micronucleus test. Negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

Partition coefficient (log Pow)	-

Component	N-Coco-1,3-diaminopropane
Ecotoxicological data	
	LC50 96 hours fish < 1 mg/l ¹)
	EC50 48 hours Daphnia < 1 mg/l ¹)
	IC50 72 hours algae < 1 mg/l ¹)
Ecotoxicology	Very toxic to aquatic organisms.
Degradation	Readily biodegradable. >60% BOD. 28 days, Closed Bottle Test (OECD 301D).
Partition coefficient (log Pow)	-
Other information	¹) The data are estimated from tests on similar products.

13. DISPOSAL CONSIDERATIONS

Disposal methods	Incineration is recommended. Dispose of in accordance with local authority requirements. Nitrous gases may be formed by incineration.

14. TRANSPORT INFORMATION

Proper shipping name	Amines, solid, corrosive, n.o.s. (N-Coco-1,3-diaminopropane)

Land transport

UN number	3259	**RID-class**	8
ADR class	8	**RID packing group**	II
ADR packing group	II		
Classification code	C8		
CEFIC number	80GC8-II+III	**Tremcard internal code**	3260

Sea transport

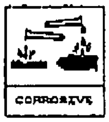
UN number	3259		
IMDG class	8	**EmS**	F-A, S-B
IMDG packing group	II	**Marine pollutant**	No.

Air transport

UN number	3259	**Subsidary risk**	-
IATA/ICAO class	8	**Packing group**	II

15. REGULATORY INFORMATION

Substance name	N-Coco-1,3-diaminopropane
Symbols	



Risk phrases	R-22 Harmful if swallowed. R-35 Causes severe burns. R-50 Very toxic to aquatic organisms.
Safety phrases	S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S-28 After contact with skin, wash immediately with plenty of 0.5% acetic acid in water, followed by washing with soap and water. S-36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S-45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S-61 Avoid release to the environment. Refer to special instructions/ Safety Data Sheets.
EU number	263-195-3
EU directive	Safety Data Sheet according to EC-directive 2001/58/EC
Water hazard classification	WGK: 3 (Germany).
Other information	In case of contact with eyes, wash immediately with a 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Always seek medical attention.

16. OTHER INFORMATION

This information only concerns the above mentioned product as supplied and may not be valid if used with other product(s) or in any process. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.

Composed by	Ann-Christin Borg Thomas Dahl
Explanations to R-phrases in section 2	R-22 Harmful if swallowed. R-35 Causes severe burns.R-50 Very toxic to aquatic organisms.
Date of printing	2003-09-01

EXHIBIT C

AKZO NOBEL

Product Information **Surface Chemistry**

Exhibit C

DUOMEEN® T

Tallowpropylenediamine
CAS no 61791-55-7

Duomeen T is an alkyl diamine of the general formula $R\text{-}NH\text{-}(CH_2)_3\text{-}NH_2$, where R represents an alkyl straight chain mainly C_{16}-C_{18}

Specification

	Limits	**Method**
Amine number, total	323-356 mg KOH/g	VV/4.001*
Colour	max 5 Gardner	SC/2.001*
Diamine, M= 319	min 92%	VV/4.001*
Iodine value	32-50 gI/100 g	VV/1.002*
Water	max 1%	VE/4.003*

*Methods of analysis can be received upon request.

Typical data

Chemical and physical data	**Typical values**
Appearance, 20°C	pale yellow paste
Density, 20°C	840 kg/m³
Density, 60°C	820 kg/m³
Equivalent Mass	169 g/eq
Flash point	>150°C
Melting range	30-40°C
Viscosity, 60°C	6 mPa s

Solubility

Soluble to a varying extent in alcohols (ethanol, IPA), chloroform and other hydrocarbons. Virtually insoluble in water.

Alkyl Chain Distribution	**Typical values**
C_{12}	1%
C_{14}	4%
C_{16}	31%
C_{18}	64%

Handling and storage

The product is not corrosive to ferrous metals. Containers made from these or high-density PE may be used. Glass lined vessels are also suitable. Zinc, copper, aluminium or their alloys should not be used. Contact with low-density PE, PVC and most rubbers are to be avoided as this may cause swelling or cracking of these materials.

To maintain colour, the product should be stored below, or, in case of bulk storage, only slightly above the melting point/cloud point. Higher temperatures can be tolerated where colour maintainance is not of concern. However, the maximum recommended heated coil surface temperature is 100°C. Prolonged heated storaged in air can cause discolouration and degredation. Heated storage vessels should be sealed (with a vent pipe) and preferably be nitrogen blanketed.

If the product is handled and stored at temperatures near or below its melting point/cloud point there is a risk of separation. In such cases the entire amount should be heated until it melts and homogenizes.

Acetate salts of the product are converted into substituted amides with low water solubility on heating at temperatures above 55°C. In applications involving heat, the temperature and time of exposure should be kept at a minimum.

Even at ambient temperatures, amines can absorb carbon dioxide and water from the atmosphere. Absorbed carbon dioxide and moisture can be removed by heating the product above 100°C.
Product can be removed from hard surfaces with high pressure hot water. For more persistent deposits, high pressure steam or washing with hot 3% acetic acid may be necessary.
The product should be handled with care. In order to avoid injuries, protective clothing, gloves and safety goggles should be used. Avoid contact with skin and inhalation of vapours.
For further information on health and safety see our Safety Data Sheet.

Further Information

For further information, technical service and samples, please contact our nearest Akzo Nobel Sales office or agent/distributor.

DUOMEEN® is a registered trademark in many countries. Issued: 2001-03-01

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Akzo Nobel Surface Chemistry AB, S-444 85 Stenungsund, Sweden
http://www.surfactantseurope.akzonobel.com

AKZO NOBEL

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY UNDERTAKING

Trade name	**DUOMEEN T**
Chemical description/Application	Chemical intermediate
Supplier	Akzo Nobel Surface Chemistry AB SE 444 85 Stenungsund SWEDEN Tel: +46 303 850 00 Fax: +46 303 813 06
Emergency telephone	+ 31 570679211 (Fax. +31 570679801) Akzo Nobel Chemicals, Deventer, NL

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a substance according to EU-legislation.

Substance name	EU number	CAS number	Concentration	Symbols	Risk phrases
N-Tallow-1,3-diaminopropane	263-189-0	61791-55-7	>92 %	C ,N	R-22, 34, 50

Other information The substance is registered in EINECS.

3. HAZARDS IDENTIFICATION

Harmful if swallowed. Causes burns. Dangerous for the environment. Very toxic to aquatic organisms.

4. FIRST AID MEASURES

General	Obtain medical attention immediately (show this Safety Data Sheet). Burns may occur several hours after the removal of the product. Skin irritation, if untreated may be prolonged and serious (eg necrosis). This may be prevented by early treatment with medium strength corticosteriods.
Inhalation	Not likely to occur. In case of exposure: Rinse nose and mouth with water. Obtain medical attention.
Skin	Remove immediately contaminated clothing and shoes. Carefully remove paste or solidified product. Wash skin immediately with 0,5 % acetic acid in water, and then with soap and water. Obtain medical attention.
Eyes	In case of contact with eyes, rinse immediately with 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention immediately. Continue to rinse during transport.
Ingestion	Only when conscious, rinse mouth, give plenty of water to drink (approx. 500 ml). Do not induce vomiting! Obtain medical attention immediately.

5. FIRE FIGHTING MEASURES

Extinguishing media	Water spray, fog or mist, foam, powder, carbon dioxide.
Unsuitable extinguishing media	Waterjet.
Special fire fighting procedures	Treat as an oil fire. Water spray may be ineffective unless used by experienced fire fighters. Wear self contained breathing apparatus.
Unusual fire hazards	Non-flammable. If involved in a fire it will support combustion and may decompose to give off toxic materials. Do not breathe fumes.
Hazardous combustion products	No typical hazardous decomposition products known.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	For personal protection see Section 8.
Environmental precautions	Should not be allowed to enter drains or water courses. Dispose of this material and its container at hazardous or special waste collection point.
Methods for cleaning up	Contain spill with inert material. Place in container for disposal according to local regulations. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. In case of large spillages contact the local authority.

7. HANDLING AND STORAGE

Handling	The usual precautions for handling chemicals should be observed. When using do not eat, drink or smoke. Avoid spilling, skin and eye contact.
Storage	To maintain quality: Avoid elevated temperatures. Reacts with copper, aluminium, zinc and their alloys. For further information see product information sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits	
Comments	No exposure limits have been established.
Engineering controls	Provide eyewash station and safety shower. Keep solutions of 0.5% acetic acid in water at hand.
Personal protection	
Respiratory	Keep respiratory equipment available. If use conditions can generate aerosol or mist, wear suitable respiratory equipment. Wear full face mask supplied with: Gas cartridge K (ammonia, green). Combination filter ABEKP.
Hand	Use protective gloves made of: Nitrile or butyl rubber.
Eyes	Wear tightly fitting safety goggles and full face visor or shield.
Skin and body	Use suitable protective clothing as protection against splashing or contamination. Dry-clean contaminated clothes before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Paste.		
Colour	Off white.		
Odour	Slightly ammonia like		
Boiling point/range (°C)	> 250	**Pressure (kPa)**	

Melting point/range (°C)	30-40		
Flash point (°C)	> 150	**Method**	Pensky-Martens ISO 2719
Autoignition temperature (°C)	> 200		
Lower explosion limit (vol %)	-		
Upper explosion limit (vol %)	-		
Vapour pressure	< 10 Pa	**Temperature (°C)**	20
Relative vapour density (air=1)	-		
Density (kg/m3)	840	**Temperature (°C)**	20
Bulk density (kg/m3)	-		
Viscosity	~ 7 mPas	**Temperature (°C)**	60
pH value	-		
pH value diluted solution	-	**Conc. (%)**	
Solubility in water	Insoluble.		
Solubility in other solvents	Soluble in hydrocarbons.		
Partition coefficient (log Pow)	-		

(These data are typical for the product and not a specification)

10. STABILITY AND REACTIVITY

Stability	Avoid elevated temperatures. Stable under recommended storage and handling conditions (see section 7).
Hazardous decomposition products	No typical hazardous decomposition products known.

11. TOXICOLOGICAL INFORMATION

Toxicological data

	LD50. oral Rat. 945 mg/kg
Irritation	Skin irritation test (rabbit): Corrosive.

Health effects

Respiratory	Emits vapours during heating. Inhalation of small volume of vapour may cause irritation of nose, throat and airway.
Skin	Causes burns. Burns may occur several hours after the removal of the product. May be absorbed through the skin.
Eyes	Causes burns. Risk of serious damage to eye. Vapour in the eyes may cause irritation and pain.
Ingestion	May cause burns in mucous membranes in throat, oesophagus and stomach.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

Partition coefficient (log -

Pow)

Component	N-Tallow-1,3-diaminopropane
Ecotoxicological data	
	LC50 96 hours fish < 1 mg/l
	EC50 48 hours Daphnia < 1 mg/l ¹)
	IC50 72 hours algae < 1 mg/l ¹)
Ecotoxicology	Very toxic to aquatic organisms.
Degradation	Readily biodegradable. >60% BOD, 28 days, Closed Bottle Test (OECD 301D).
Partition coefficient (log Pow)	-
Other information	¹) The data are estimated from tests on similar products.

13. DISPOSAL CONSIDERATIONS

Disposal methods	Incineration is recommended. Dispose of in accordance with local authority requirements. Nitrous gases may be formed by incineration.
Waste category	Hazardous waste in accordance with the Council Directive 91/689/EEC of 12 December 1991 on hazardous waste.

14. TRANSPORT INFORMATION

Proper shipping name	Amines, solid, corrosive, n.o.s. (Alkylpropylene diamine)		
Land transport			
UN number	3259	**RID-class**	8
ADR class	8	**RID packing group**	II
ADR packing group	II		
Classification code	C8		
CEFIC number	80GC8-II+III	**Tremcard internal code**	3260
Sea transport			
UN number	3259		
IMDG class	8	**EmS**	F-A, S-B
IMDG packing group	II	**Marine pollutant**	No.
Air transport			
UN number	3259	**Subsidary risk**	-
IATA/ICAO class	8	**Packing group**	II
Other information	Bulk tank. Addition to proper shipping name: molten.		

15. REGULATORY INFORMATION

Substance name	N-Tallow-1,3-diaminopropane
Symbols	

Risk phrases	R-22 Harmful if swallowed. R-34 Causes burns. R-50 Very toxic to aquatic organisms.
Safety phrases	S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S-28 After contact with skin, wash immediately with plenty of 0.5% acetic acid in water, followed by washing with soap and water. S-36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S-45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S-61 Avoid release to the environment. Refer to special instructions/ Safety Data Sheets.
EU number	263-189-0
EU directive	Safety Data Sheet according to EC-directive 2001/58/EC
Water hazard classification	WGK: 3 (Germany).
Other information	In case of contact with eyes, wash immediately with a 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Always seek medical attention.

16. OTHER INFORMATION

This information only concerns the above mentioned product as supplied and may not be valid if used with other product(s) or in any process. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.

Important changes were made in section	14
Composed by	Ann-Christin Borg Thomas Dahl
Explanations to R-phrases in section 2	R-22 Harmful if swallowed. R-34 Causes burns.R-50 Very toxic to aquatic organisms.
Date of printing	2003-09-01

AKZO NOBEL

Product Information **Surface Chemistry**

Exhibit D

DUOMEEN® O

Oleylpropylenediamine
CAS no 7173-62-8

Duomeen O is an alkyl diamine of the general formula $R\text{-}NH\text{-}(CH_2)_3\text{-}NH_2$, where R represents an alkyl straight chain mainly C18.

Einecs no 230-528-9

Specification

	Limits	Method
Amine number, total	313 - 349 mg KOH/g	VV/4.001*
Colour	max 8 Gardner	SC/2.001*
Diamine, Mw=322	min 90%	VV/4.001*
Iodine value	min 60 gI/100 g	VV/1.002*
Water content	max 0.5%	VE/4.003*

*Methods of analysis can be received upon request.

Typical data

Chemical and physical data	Typical values
Appearance, 20°C	yellow liquid/paste
Density, 20°C	840 kg/m³
Density, 60°C	820 kg/m³
Equivalent Mass	170 g/eq
Flash point	>150°C
Melting range	10 - 20°C
Viscosity, 60°C	6 mPa s

Solubility
Soluble to a varying extent in alcohols (ethanol, IPA), chloroform and other hydrocarbons. Virtually insoluble in water.

Typical data are based on our own measurements or derived from the literature. They do not constitute part of the delivery specifications.

Alkyl Chain Distribution	Typical values
Alkyl chain distr C_{12}	1%
Alkyl chain distr C_{14}	4%

Alkyl chain distr C_{16}	–	12%	–
Alkyl chain distr C_{18}		83%	

The specifications and properties listed above are intended for products manufactured in Europe.

Handling and safety

The product is stable for at least 3 years, if stored at room temperature in sealed and undamaged containers.

The product is not corrosive to ferrous metals. Containers made from these or high-density PE may be used. Glass lined vessels are also suitable. Zinc, copper, aluminium or their alloys should not be used. Contact with low-density PE, PVC and most rubbers are to be avoided as this may cause swelling or cracking of these materials.

To maintain colour, the product should be stored below, or, in the case of bulk storage, only slightly above the melting point/cloud point. Higher temperatures can be tolerated where colour maintenance is not of concern. However, the maximum recommended heating coil surface temperature is 100°C. Prolonged heated storage in air can cause discoloura-tion and degredation. Heated storage vessels should be sealed (with a vent pipe) and preferably be nitro-gen blanketed.

If the product is handled and stored at temperatures near or below its melting point/cloud point there is a risk of separa-tion. In such cases the entire amount should be heated until it melts and homogenizes.

Acetate salts of the product are converted into substituted amides with low water solubility on heating at temperatures above 55°C. In applications involving heat, the temperature and time of exposure should be kept at a minimum.

Even at ambient temperatures, amines can absorb carbon dioxide and water from the atmosphere. Absorbed carbon dioxide and moisture can be removed by heating the product above 100°C.

Product can be removed from hard surfaces with high pressure hot water. For more persistent deposits, high pressure steam or washing with hot 3% acetic acid may be necessary.

The product should be handled with care. In order to avoid injuries, protective clothing, gloves and safety goggles should be used. Avoid contact with skin and inhalation of vapours.

For further information on health and safety see our Safety Data Sheet.

For further information, technical service and samples, please contact our nearest Akzo Nobel Sales office or agent.

Packing

- Bulk, heated containers or road tankcars.
- Drum, steel, non coated tight head, net weight 170 kg.

Further Information

For further information, technical service and samples, please contact our nearest Akzo Nobel Sales office or agent/distributor.

DUOMEEN® is a registered trademark in many countries. Issued: 2004-12-01

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consequential damages, including, without limitation, lost profit, loss of income, loss of business opportunity and any other related costs and expenses.

Akzo Nobel Surface Chemistry AB, S-444 85 Stenungsund, Sweden
http://www.surfactantseurope.akzonobel.com

AKZO NOBEL

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY UNDERTAKING

Trade name	**DUOMEEN O**
Chemical description/Application	Surfactant
Supplier	Akzo Nobel Surface Chemistry AB SE 444 85 Stenungsund SWEDEN Tel: +46 303 850 00 Fax: +46 303 813 06
Emergency telephone	+ 31 570679211 (Fax. +31 570679801) Akzo Nobel Chemicals, Deventer, NL

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a substance according to EU-legislation.

Substance name	EU number	CAS number	Concentration	Symbols	Risk phrases
N-Oleyl-1,3-diaminopropane	230-528-9	7173-62-8	>90 %	C ,N	R-22, 34, 50

Other information	The substance is registered in EINECS.

3. HAZARDS IDENTIFICATION

Causes burns. Harmful if swallowed. Dangerous for the environment. Very toxic to aquatic organisms.

4. FIRST AID MEASURES

General	Obtain medical attention immediately (show this Safety Data Sheet). Burns may occur several hours after the removal of the product. Skin irritation, if untreated may be prolonged and serious (eg necrosis). This may be prevented by early treatment with medium strength corticosteriods.
Inhalation	Not likely to occur. In case of exposure: Rinse nose and mouth with water. Obtain medical attention.
Skin	Remove immediately contaminated clothing and shoes. Carefully remove paste or solidified product. Wash skin immediately with 0,5 % acetic acid in water, and then with soap and water. Obtain medical attention.
Eyes	In case of contact with eyes, rinse immediately with 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention immediately. Continue to rinse during transport.
Ingestion	Only when conscious, rinse mouth, give plenty of water to drink (approx. 500 ml). Do not induce vomiting! Obtain medical attention immediately.

5. FIRE FIGHTING MEASURES

Extinguishing media	Water spray, fog or mist, foam, powder, carbon dioxide.
Unsuitable extinguishing media	Waterjet.
Special fire fighting procedures	Treat as an oil fire. Water spray may be ineffective unless used by experienced fire fighters. Wear self contained breathing apparatus.
Unusual fire hazards	Non-flammable. If involved in a fire it will support combustion and may decompose to give off toxic materials. Do not breathe fumes.
Hazardous combustion products	No typical hazardous decomposition products known.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	For personal protection see Section 8.
Environmental precautions	Should not be allowed to enter drains or water courses. Dispose of this material and its container at hazardous or special waste collection point.
Methods for cleaning up	Contain spill with inert material. Place in container for disposal according to local regulations. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. In case of large spillages contact the local authority.

7. HANDLING AND STORAGE

Handling	The usual precautions for handling chemicals should be observed. When using do not eat, drink or smoke. Avoid spilling, skin and eye contact.
Storage	To maintain quality: Avoid elevated temperatures. Reacts with copper, aluminium, zinc and their alloys. For further information see product information sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits	
Comments	No exposure limits have been established.
Engineering controls	Provide eyewash station and safety shower. Keep solutions of 0.5% acetic acid in water at hand.
Personal protection	
Respiratory	Keep respiratory equipment available. If use conditions can generate aerosol or mist, wear suitable respiratory equipment. Wear full face mask supplied with: Gas cartridge K (ammonia, green). Combination filter ABEKP.
Hand	Use protective gloves made of: Nitrile or butyl rubber.
Eyes	Wear tightly fitting safety goggles and full face visor or shield.
Skin and body	Use suitable protective clothing as protection against splashing or contamination. Dry-clean contaminated clothes before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid/paste.		
Colour	Yellow.		
Odour	Slightly ammonia like		
Boiling point/range (°C)	> 250	**Pressure (kPa)**	

Melting point/range (°C)	9-20		
Flash point (°C)	> 100	**Method**	Pensky-Martens ISO 2719
Autoignition temperature (°C)	-		
Lower explosion limit (vol %)	-		
Upper explosion limit (vol %)	-		
Vapour pressure	< 10 Pa	**Temperature (°C)**	20
Relative vapour density (air=1)	-		
Density (kg/m3)	840	**Temperature (°C)**	25
Bulk density (kg/m3)	-		
Viscosity	-	**Temperature (°C)**	
pH value	-		
pH value diluted solution	-	**Conc. (%)**	
Solubility in water	Insoluble.		
Solubility in other solvents	-		

(These data are typical for the product and not a specification)

10. STABILITY AND REACTIVITY

Stability	Avoid elevated temperatures. Stable under recommended storage and handling conditions (see section 7).
Hazardous decomposition products	No typical hazardous decomposition products known.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Health effects

Respiratory	Emits vapours during heating. Inhalation of small volume of vapour may cause irritation of nose, throat and airway.
Skin	Causes burns. Burns may occur several hours after the removal of the product. May be absorbed through the skin.
Eyes	Causes burns. Risk of serious damage to eye. Vapour in the eyes may cause irritation and pain.
Ingestion	May cause burns in mucous membranes in throat, oesophagus and stomach.

Component N-Oleyl-1,3-diaminopropane

Toxicological data

LD50. oral rat > 200-2000 mg/kg ¹)

Toxicological information 1) The value is estimated from tests on similar products.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

Degradation	Primary biodegradation > 90%. The product complies with the decree on surfactant biogradebillity of the European Community (73/404/EEG; 73/405/EEG)
Component	**N-Oleyl-1,3-diaminopropane**
Ecotoxicological data	
	LC50 96 hours fish < 1 mg/l ¹)
	EC50 48 hours Daphnia < 1 mg/l
	IC50 72 hours algae < 1 mg/l ¹)
Ecotoxicology	Very toxic to aquatic organisms.
Degradation	Readily biodegradable. >60% BOD, 28 days, Closed Bottle Test (OECD 301D).
Other Information	¹) The data are estimated from tests on similar products.

13. DISPOSAL CONSIDERATIONS

Disposal methods	Incineration is recommended. Dispose of in accordance with local authority requirements. Nitrous gases may be formed by incineration.

14. TRANSPORT INFORMATION

Proper shipping name	Amines, liquid, corrosive, n.o.s. (N-Oleyl-1,3-diaminopropane)		
Land transport			
UN number	2735	**RID-class**	8
ADR class	8	**RID packing group**	II
ADR packing group	II		
Classification code	C7		
CEFIC number	80GC7-II+III	**Tremcard internal code**	541
Sea transport			
UN number	2735		
IMDG class	8	**EmS**	F-A, S-B
IMDG packing group	II	**Marine pollutant**	No.
Air transport			
UN number	2735	**Subsidary risk**	-
IATA/ICAO class	8	**Packing group**	II

15. REGULATORY INFORMATION

Substance name	N-Oleyl-1,3-diaminopropane
Symbols	

Risk phrases	R-22 Harmful if swallowed. R-34 Causes burns. R-50 Very toxic to aquatic organisms.
Safety phrases	S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S-28 After contact with skin, wash immediately with plenty of 0.5% acetic acid in water, followed by washing with soap and water. S-36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S-45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S-61 Avoid release to the environment. Refer to special instructions/ Safety Data Sheets.
EU number	230-528-9
EU directive	Safety Data Sheet according to EC-directive 2001/58/EC
Water hazard classification	WGK: 3 (Germany).
Other information	In case of contact with eyes, wash immediately with a 0.5% acetic acid in water for a few minutes, followed by rinsing with plenty of water for as long as possible. Eyelids should be held away from the eyeball to ensure thorough rinsing. Always seek medical attention.

16. OTHER INFORMATION

This information only concerns the above mentioned product as supplied and may not be valid if used with other product(s) or in any process. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.

Important changes were made in section	15.
Composed by	Barbro Dihné Magnus Franck
Explanations to R-phrases in section 2	R-22 Harmful if swallowed. R-34 Causes burns.R-50 Very toxic to aquatic organisms.
Date of printing	2003-06-26

EXHIBIT E

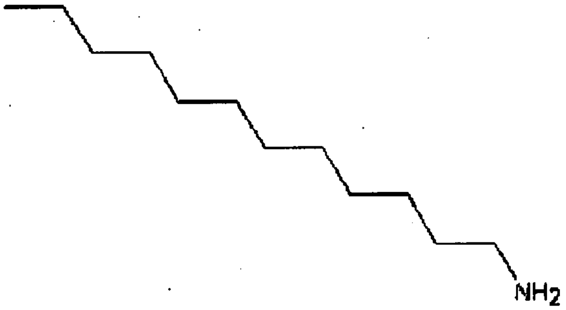
NIST

Standard Reference Data Program | Data Gateway | Online Databases | Chemistry WebBook

Exhibit E

1-Dodecanamine

- **Formula:** $C_{12}H_{27}N$
- **Molecular Weight:** 185.35
- **CAS Registry Number:** 124-22-1
- **Chemical Structure:**



This structure is also available as a 2d Mol file.

- **Other Names:** Dodecylamine; n-Dodecylamine; Alamine 4; Armeen 12D; Laurinamine; Laurylamine; Nissan Amine BB; 1-Aminododecane; Amine 12; Armeen 12; Lauramine; Lauramine (primary amine); Radiamine 6164
- Notes / Error Report
- **Other Data Available:**
  - Phase change data
  - Reaction thermochemistry data
  - IR Spectrum
  - Mass Spectrum
- Switch to calorie-based units

Notes / Error Report

Go To: Top

- Data from NIST Standard Reference Database 69 - March 2003 Release: *NIST Chemistry WebBook*
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AKZO NOBEL

Product Information Surface Chemistry

ARMEEN® 12D

Dodecylamine, distilled
CAS no 124-22-1

Primary alkyl amine of the general formula R-NH_2, where R represents a straight alkyl chain mainly C_{12}.
CAS Name: 1-Dodecanamine
EINECS: 204-690-6
Synonyms: Laurylamine

Specification

	Limits	**Method**
Alkyl chain distr C_{12}	min 98%	CG/3.002*
Amine number, total	297-304 mgKOH/g	VE/1.005*
Colour Gardner	max 1	SC/2.001*
Primary amine, M=185	min 98%	VE/1.005*
Sec. + tertiary amine, M=353	max 2%	VE/1.005*
Water	max 0.5%	VE/4.003*

*Methods of analysis can be received upon request.

Typical data

Chemical and physical data	**Typical values**
Amine number, total	302 mgKOH/g
Appearance, 20°C	white solid
Colour APHA	5
Colour Gardner	<1
Density, 20°C	800 kg/m^3
Density, 60°C	780 kg/m^3
Flash point	>100°C
Iodine value	1 gI/100 g
Melting range	20-25°C
Odour	mild ammoniacal
Primary amine, M=185	99.4%
Sec. + tertiary amine, M=353	0.1%
Viscosity, 60°C	4 mPa.s
Water	<0.2%

Solubility

Soluble to a varying extent in alcohols (ethanol, IPA), chloroform and other hydrocarbons. Virtually insoluble in water.

Typical data are based on our own measurements or derived from the literature. They do not constitute part of the delivery specifications.

Alkyl Chain Distribution	**Typical values**
<=C10	0.5%
>=C14	1%
C_{12}	98.5%

The specifications and properties listed above are intended for products manufactured in Europe.

Applications/Functions

* Intermediate
- ethoxylates
- dodecylguanidine acetate

Packing

- Bulk, heated containers or road tankcars.
- Drum, steel, non coated tight head, net weight 155 kg.

Stability, Storage and Handling

Armeen 12D is stable for at least 3 years, if stored at room temperature in sealed and undamaged containers.

Armeen 12D is not corrosive to ferrous metals. Containers made from these or high-density PE may be used. Glass lined vessels are also suitable. Zinc, copper, aluminium or their alloys should not be used. Contact with low-density PE, PVC and most rubbers is to be avoided as this may cause swelling or cracking of these materials.

To maintain colour, **Armeen 12D** should be stored below, or, in the case of bulk storage, only slightly above the melting point/cloud point. Higher temperatures can be tolerated where colour maintenance is not of concern. However, the maximum recommended heating coil surface temperatures is 100°C. Prolonged heated storage in air can cause discolouration and degradation. Heated storage vessels should be sealed (with a vent pipe) and preferably be nitrogen blanketed.

Even at ambient temperatures, amines can absorb carbon dioxide and water from the atmosphere. Absorbed carbon dioxide and moisture can be removed by heating the product above 100°C.

Armeen 12D can be removed from hard surfaces with high pressure hot water. For more persistent deposits, high pressure steam or washing with hot 3% acetic acid may be necessary.

Quality Assurance

The manufacture of this product is controlled by a Quality Management System, which has been assessed and registered as meeting the requirements of ISO9002 / EN29002. More details on request.

Health and Safety

Armeen 12D should be handled with care. In order to avoid injuries, protective clothing, gloves and safety goggles should be used. Avoid contact with skin and inhalation of vapours. For further information on health and safety see our Safety Data Sheet.

Further Information

For further information, technical service and samples, please contact our nearest Akzo Nobel Sales office or agent/distributor.

Issued: 2002-04-24

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